

Age determination materials and equipment

Jonathan A. Short

Resource Ecology and Fisheries Management Division
Alaska Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
7600 Sand Point Way NE
Seattle, WA 98115

Email address for contact author: jon.short@noaa.gov

Virtually all of the equipment employed by the Alaska Fisheries Science Center Age and Growth Program is used to enhance the visibility of annual marks so they can be contrasted with checks (non-annual marks) and be more easily counted. Equipment and supplies are broken up into the following categories: general supplies (Table 1), sample storage (Table 2), specimen preparation (Table 3), microscopes, imaging, and software (Table 4), and vendors (Table 5)¹.

The equipment and supplies tables alphabetically list item name, purpose, manufacturer, model, and vendor. The purpose column describes a primary use for each item, although many items will have multiple uses that are not listed. The manufacturer column may be blank if the manufacturer is unknown or may be listed as “generic” for common items if any manufacturer is adequate. There are many items that could easily be substituted, such as paper cups and tongue depressors, but specific model numbers and manufacturers are given for the sake of clarity.

¹ References to trade names or commercial entities do not imply endorsement by the National Marine Fisheries Service, NOAA.

Table 1
Equipment and supplies - general supplies.

Item	Purpose	Manufacturer	Model	Vendor
Dissecting needle - straight	Sample handling		08965A	Fisher Scientific
Forceps	Sample handling	Miltex	Semkin dressing - 5	Tru-Care Health Systems
Forceps - fine tip	Sample handling	Miltex	Jeweler style	Fisher Scientific
Latex gloves	Sample handling	Evolution	11-462-68 (B-E)	Fisher Scientific
Mineral oil	Clearing break and burns	Generic		
Modeling clay - green	Microscope stage	Permoplast	SB33496M	Nasco
Nitrile gloves	Sample handling	Fisher	19-130-1597(B-E)	Fisher Scientific
Paint brushes – artists'	Mineral oil application	Generic	Fine tip	
Petri dish bottom - large	Microscope stage	Kimble	100 mm x 15 mm	VWR
Petri dish bottom - small	Microscope stage	Kimble	60 mm x 15 mm	VWR
Rubber cement	Microscope stage	Generic		
Task wipers - large	Clean-up	Kimberly Clark	KIM34256BX	GSA Advantage
Task wipers - small	Clean-up	Kimberly Clark	34155	GSA Advantage
Velvet - black	Microscope stage		"Royalty"	Jo-Ann Fabric and Craft
Watch glass	Microscope stage		Syracuse 913A	Fisher Scientific

Table 2
Equipment and supplies - sample storage.

Item	Purpose	Manufacturer	Model	Vendor
Barcode scanner - USB	Otolith sample tracking	Metrologic	Voyager MS9540	Bar Code Equipment Services
Boxes - plastic (box & lid)	Survey otolith collections	Consolidated Plastics	65260KY, 65230KY	Consolidated Plastics
Ethanol - specimen	Otolith preservative - round fish		70 grain ethanol diluted from 95%	Washington State Liquor Control Board
Foam insert	Survey otolith collections	The Foam Shop	Closed cell foam (1.5" x 48" x 108")	The Foam Shop
Glycerol	Otolith preservative - flatfish		Certified ACS	Fisher Scientific
HMIG labels - custom	Sample labeling		Lab Safety Supply	30913TC
Sample boxes - custom	Observer otolith collections	McCallum Co	Custom cardboard	McCallum Co
Sample boxes - custom	Survey otolith collections		Custom Styrofoam	
Scintillation vials	Survey otolith collections	Wheaton	20 ml PET w/ poly seal cap attached (986736)	Fisher Scientific
Storage containers - plastic	Otolith section containment	Fred Meyer	6.2" x 4.6" x 2.7"	Fred Meyer
Thymol	Otolith preservative - flatfish	Alfa Aesar	98+%	VWR
Vial cap labels - white	Sample labeling	Avery	AVER808	Kipper Tool
Vial caps - black	Survey otolith collections	Acme Vial and Glass	PS18 cap 18-400 black phenolic polyseal liner	Acme Vial and Glass Co
Vials - glass	Survey otolith collections	Acme Vial and Glass	S910-4 (4 dram) Short Style Clear	Acme Vial and Glass Co
Vials - hinged polypropylene	Observer otolith collections	LA Container	EP290 2.5 dram (9.5 ml) 0.68" x 2.25"	LA Container

Table 3
Equipment and supplies - specimen preparation.

Item	Purpose	Manufacturer	Model	Vendor
Alcohol burner	Otolith burning		SB34435M - 4 oz	Nasco
Aluminum oven trays	Otolith burning	Custom		Unknown
Artificial water	Otolith mounting	Wildlife Artists Supply	AW100-128 (1 gallon kit)	Wildlife Artists Supply
Ball bearings - Tyslide saw	Saw repair	ABEC-1	6138K14 Stainless steel	McMaster-Carr
Benchtop Tyslide saw	Thin-sectioning	Tyslide	565-021	Jencons, Ltd
Cigarette lighter	Lighting alcohol burners	Bic		Grocery store
Contact cement	Adhering grinding discs	Generic		
Cups - waxed paper	Resin and silicone mixing	Igloo	8295 - 9 oz	MSC Industrial supply
Diamond wheel	Otolith cutting	Norton	69014192342 - 3"	B. E. E. Industries
Diamond wheel	Otolith cutting	Norton	69014192064 - 4"	Bee Industrial Supply
Ecomet	Otolith coring, grinding	Buehler LTD		Buehler LTD
Ethanol - alcohol burner			95% ethanol	WA Liquor Control Board
Glass slides	Otolith sectioning	Hillquist	10-19 - 2" x 3"	Hillquist
Grinding discs - PSA	Otolith coring, grinding	Struers	PAPNO 320 - 320 grit	Struers
Grinding discs - PSA	Otolith coring, grinding	Buehler LTD	305118320100 - 320 grit	Buehler LTD
Grinding discs - PSA	Otolith coring, grinding	Struers	PAPZO 600 - 600 grit	Struers
HDPE plastic	Otolith mold construction		HDS55230035	MSC Industrial supply
HDPE plastic	Otolith mold construction		HDS55265035	MSC Industrial supply
High speed blades	Otolith sectioning	Pro-Slicer	4" x 0.004" x 5/8"	Pearson's US lapidary
Isomet 5000	Otolith cutting	Buehler LTD		Buehler LTD
Isomet low speed saw	Otolith cutting	Buehler LTD		Buehler LTD
Mold-making catalyst	Otolith mold construction	Dow Corning	1 catalyst	Robert McKeown
Mold-making silicone	Otolith mold construction	Dow Corning	3112 RTV	Robert McKeown
Pill cutter	Otolith cutting	Dura-med		Amazon.com
Sandpaper	Otolith sanding	3M Abrasives	B54979 - P600A	Noble Sales
Scalpel blades - carbon steel	Otolith cutting		BD-371310	VWR
Thin Section machine	Thin-sectioning	Hillquist	1005	Hillquist
Toaster oven	Otolith burning	Panasonic	NBG100PS	Nowonsale.com
Toaster oven	Otolith burning	Black and Decker	FC150BR	Amazon.com
Tongue depressors	Resin and silicone mixing	Puritan Medical	705A/704	Stanley Supply & Services

Table 4
Equipment and supplies - microscopes, imaging, and software.

Item	Purpose	Manufacturer	Model	Vendor
Bifurcated light guides	Specimen imaging	Chiu Tech	GVL-18-8	Chiu Tech
Compressed air	Microscope cleaning	Generic		
Cotton swabs	Microscope cleaning	Generic		
Digital microscopy camera	Specimen imaging	Leica	DFC 420	Bartels and Stout
Halogen bulbs	Light source repair	LAMP	EJA projector lamp	Adorama
ImagePro software	Specimen measurements	Media Cybernetics	ImagePro Plus 5.0	Tanji
Leica Application Suite (LAS) software	Specimen imaging	Leica	LAS 2.7.1	Bartels and Stout
Light sources	Specimen imaging	Chiu Tech	FO-150	Chiu Tech
Photoshop Elements	Image merging, annotating	Adobe	Photoshop Elements 4.0	
Replacement fan for light source	Light source repair		80 x 80 x 25.4 mm, 120v, 21 CFM, 115 VAC, imp protected	Chiu Tech
Stereo microscopes - ergonomic	Specimen viewing	Leica	MZ 9 _s	Bartels and Stout
Stereo microscopes - imaging	Specimen imaging	Leica	MZ 9 _s	Bartels and Stout
Stereo microscopes - standard	Specimen viewing	Leica	MZ 9 _s	Bartels and Stout

Table 5
Equipment and supply vendors.

Company	Phone	Web Site
Acme Vial and Glass Co	(800) 394-2745	www.acmevial.com
Adorama	(888) 582-2500	www.adorama.com
Airgas Norpac	(206) 224-0430	www.airgas.com
Bar Code Equipment Serv.	(904) 249-3862	www.barcodeservice.com
Bartels and Stout	(425) 453-1705	www.bartelsandstout.com
BEE Industrial Supply	(510) 293-3180	www.beeind.com
Buehler Ltd	(800) 283-4537	www.buehler.com
Chiu Technical Corporation	(631) 544-0606	www.chiutech.com
Consolidated Plastics	(800) 362-1000	www.consolidatedplastics.com
Fisher Scientific	(800) 640-0640	www.fishersci.com
Foam Shop, The	(206) 525-2301	www.friendlyfoam.com
Forestry Suppliers Inc	(800) 647-5368	www.forestry-suppliers.com
Global Computer Supply	(888) 445-2725	www.globalcomputer.com
GSA Advantage	(877) 472-3777	www.gsaadvantage.gov
Hillquist	(303) 722-9766	www.hillquist.com
Jencons Ltd	+44 1342 337474	www.jencons.co.uk
Jo-Anns Fabric and Craft	(888) 739-4120	www.joann.com
Kelsun Distributors	(425) 453-1199	www.kelsun.com
Kipper Tool	(770) 532-3232	www.kippertool.com
LA Container	(714) 694-0101	www.lacontainerstore.com
Lab Safety Supply	(800) 356-0783	www.labsafety.com
McCallum Co	(888) 368-9445	www.mccallumco.com
McMaster-Carr	(562) 463-4277	www.mcmaster.com
MSC Industrial Supply	(800) 645-7270	www.mscdirect.com
Nasco	(800) 558-9595	www.enasco.com
Noble Sales	(791) 871-1911	www.noblegov.com
NowOnSale.com		www.nowonsale.com
Pearson's U.S. Lapidary	(877) 765-7787	www.pearsons-usli.com
Polymer Clay Express	(800) 844-0138	www.ploymerclayexpress.com
Robert McKeown	(908) 218-9000	www.robertmckeown.com
Stanley Supply & Services	(800) 453-3169	www.stanleysupplyservices.com
Struers	(888) 787-8377	www.struers.com
Tru-Care Health Systems	(800) 842-2734	www.tru-care.com
University Bookstore	(800) 335-7323	www.bookstore.washington.edu
VWR	(800) 932-5000	www.vwr.com
WA State Liquor Control Board	(360) 664-1600	www.liq.wa.gov
Wesco Autobody Supply Inc	(206) 527-0808	www.wescopbe.com
Wildlife Artists Supply	(800) 334-8012	www.taxidermy.com